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## Investigating the interplay of yogic practices and interval training on specific physiological variables among high school girls

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### Abstract

The primary aim of this research was to ascertain whether notable enhancements in the efficiency of physiological and biochemical variables could be observed through the implementation of carefully selected asanas and interval training. In pursuit of this objective, the research scholar employed a meticulous random sampling method to ensure a representative cohort. The study encompassed a total of ninety female participants, thoughtfully selected from a pool of 150 students at Govt. Girls Higher Secondary School in Ta-Deori, Gondia, Nagpur, Maharashtra, with ages ranging from 12 to 15 years.

The research design employed a pre- and post-tests approach, incorporating sophisticated analysis of covariance techniques to glean nuanced insights. The results revealed that the integration of yogic practices and interval training led to statistically significant improvements in key physiological parameters, namely pulse rate, breath-holding time, and vital capacity.

Upon comparative analysis, the Experimental Group-I, focusing on yogic practices, exhibited noteworthy advancements in pulse rate, vital capacity, and breath-holding time when contrasted with the Control Group. Similarly, the Experimental Group-II, dedicated to interval training, displayed significant improvements in the same physiological variables when compared to the Control Group. Interestingly, when Experimental Group-I and Experimental Group-II were juxtaposed, Experimental Group-I exhibited no significant difference in physiological variables, while Experimental Group-II demonstrated noteworthy distinctions.

In light of these findings, it is recommended that similar studies be conducted with distinct focus on male subjects across diverse age groups. This approach would contribute to a more nuanced understanding of the nuanced effects of yogic practices and interval training on physiological variables among different demographic profiles.

**Keywords:** Biochemical, interval training, physiological, yogic practices

### Introduction

In the contemporary era, the significance of sports in our lives is paramount. Not too distant in the past, it was perceived as a leisure pursuit exclusive to the affluent. However, in the present age, under the influence of modern conditions, millions of individuals actively engage in various sporting activities, and sports have seamlessly integrated into the intricate tapestry of modern existence. Serving as a counterbalance to the prevalent excesses and luxuries of today, sports have evolved beyond a pastime, emerging as a dynamic force that contributes to the equilibrium of contemporary lifestyles.

### Yoga

Yoga is a comprehensive system of physical, mental, and spiritual practices that originated in ancient India. The word "yoga" is derived from the Sanskrit root "yuj," meaning to yoke or unite, symbolizing the union of body, mind, and spirit. Rooted in ancient Indian philosophy and spiritual traditions, yoga has evolved over thousands of years and has become a global phenomenon embraced by people from various cultures and backgrounds.

Yoga conveys a holistic message to humanity, encompassing the human body, mind, and soul. It imparts wisdom for physical well-being, mental harmony, and spiritual enlightenment. It is imperative for the intellectually adept and capable youth to step forward and disseminate this profound message to individuals not only within India but across every corner of the globe.

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The foundational text of yoga is the "Yoga Sutras," attributed to the sage Patanjali, which systematically outlines the principles and practices of yoga. Yoga encompasses a diverse range of techniques and paths, each tailored to address different aspects of human existence. The main paths of yoga include:

- **Hatha Yoga:** This is perhaps the most well-known form of yoga in the Western world. It emphasizes physical postures (asanas), breath control (pranayama), and meditation to achieve a balance between the body and mind.
- **Raja Yoga:** Also known as the "Royal Path," Raja Yoga is centered around meditation and the cultivation of mental discipline. It incorporates ethical and moral guidelines (yamas and niyamas), concentration (dharana), and meditation (dhyana) to achieve self-realization.
- **Karma Yoga:** This path focuses on selfless action and service, emphasizing performing one's duties without attachment to the results. It encourages individuals to act with a sense of duty and responsibility, fostering a mindset of detachment from personal gain.
- **Bhakti Yoga:** Bhakti Yoga is the path of devotion and love for the divine. Practitioners express their devotion through prayer, chanting, and rituals, aiming to cultivate a deep connection with the divine.
- **Jnana Yoga:** This path involves the pursuit of knowledge and wisdom. Jnana Yoga encourages selfinquiry, contemplation, and the study of philosophical texts to attain a deeper understanding of the self and reality.
- **Kundalini Yoga:** Kundalini refers to the dormant spiritual energy believed to reside at the base of the spine. Kundalini Yoga involves practices like breathwork, postures, and chanting to awaken and channel this energy through the chakras, fostering spiritual awakening.

Yoga is not just a physical exercise; it is a holistic approach to well-being that promotes physical health, mental clarity, and spiritual awareness. Regular practice of yoga is associated with numerous benefits, including improved flexibility, strength, balance, and reduced stress. Moreover, yoga is renowned for its ability to enhance mental focus, promote emotional balance, and contribute to a sense of inner peace.

In the modern world, various yoga styles have emerged, catering to different preferences and fitness levels. These may include Vinyasa, Ashtanga, Iyengar, Bikram, and many more. Regardless of the style, the essence of yoga remains grounded in the pursuit of self-awareness, harmony, and the unity of the individual with the larger cosmos. As yoga continues to evolve and adapt, it remains a profound tool for personal transformation and holistic well-being.

### Interval Training

Interval training is a highly effective and versatile exercise approach that involves alternating periods of intense exertion with periods of rest or lower-intensity activity. This training method has gained widespread popularity for its efficiency in improving cardiovascular fitness, enhancing endurance, and promoting various physiological adaptations.

Interval training involves exposing the body to brief yet recurring periods of reduced intensity. This method is endorsed by numerous leading coaches, trainers, and accomplished athletes who have harnessed its benefits.

Repeating a designated distance a specified number of times characterizes interval training.

The recovery phase entails a leisurely jog and relaxation for the athlete.

### Key Components of Interval Training

#### 1. Intensity Variation

Interval training involves alternating between high-intensity intervals, where individuals exert themselves close to their maximum capacity, and low-intensity or rest intervals. This variation challenges the cardiovascular system and promotes improved fitness levels.

#### 2. Flexibility in Exercise Modalities

Interval training can be applied to various forms of exercise, including running, cycling, swimming, and strength training. This flexibility makes it adaptable to different fitness levels, preferences, and goals.

#### 3. Structured Workouts

Workouts are organized into sets of intervals, typically denoted by work-to-rest ratios. For example, a common ratio might be 30 seconds of intense effort followed by 30 seconds of rest. The structure allows for customization based on fitness levels and goals.

### Benefits of Interval Training

#### ▪ Improved Cardiovascular Health

The high-intensity intervals elevate heart rate and promote cardiovascular adaptations, such as increased stroke volume and improved cardiac output. This, in turn, enhances overall cardiovascular health.

#### ▪ Enhanced Fat Burning

Interval training has been shown to boost the body's ability to burn fat during and after exercise. The intense efforts create an "afterburn" effect, known as excess post-exercise oxygen consumption (EPOC), contributing to increased calorie expenditure.

#### ▪ Time Efficiency

One of the significant advantages of interval training is its time efficiency. Short, intense workouts can produce comparable or even superior results to longer, moderate-intensity sessions, making it suitable for individuals with busy schedules.

#### ▪ Improved Metabolic Rate

Regular interval training has been associated with improved metabolic rate and insulin sensitivity, which can positively impact weight management and metabolic health.

#### ▪ Enhanced Endurance and Performance

Interval training challenges the body's energy systems, leading to increased aerobic and anaerobic capacity. This results in improved endurance, stamina, and overall athletic performance.

#### ▪ Adaptability to Various Fitness Levels

Interval training can be adapted to different fitness levels by adjusting the duration, intensity, and frequency of intervals. Beginners and seasoned athletes alike can tailor workouts to suit their capabilities.

### Considerations for Interval Training

#### ▪ Proper Warm-Up and Cool Down

Given the intensity of interval training, a thorough warm-up and cool-down are crucial to prevent injuries and optimize performance.

#### ▪ Individualization

Interval training should be tailored to individual fitness levels, taking into account factors such as age, health

status, and exercise experience.

#### ▪ **Consistency**

Like any exercise regimen, consistency is key to experiencing the full benefits of interval training. Regular sessions over time yield the best results.

Interval training offers a dynamic and efficient approach to fitness, catering to a wide range of individuals with diverse goals. Its adaptability, time efficiency, and numerous health benefits make it a popular choice for those seeking to enhance their overall well-being and physical performance.

#### **Statement of the Problem**

The primary objective of this investigation was to discern whether the implementation of specific asanas and interval training could lead to a significant enhancement in the efficiency of physiological and biochemical variables. The hypotheses proposed variations in the response of selected physiological variables to yogasanas and interval training, as well as significant differences in the responses among yogic practices and interval training groups.

#### **Significance of the Problem**

The study aimed to shed light on whether selected yogasanas and interval training could induce desirable changes in selected physiological variables.

Additionally, it sought to determine whether one exercise program exhibited a marked difference over the other in bringing about changes in the selected physiological variables.

#### **Delimitations**

Subjects were randomly selected from Govt. Girls Higher Secondary School, Ta-Deori, Gondia, Nagpur, Maharashtra.

The study focused on the age group ranging from 12 to 15 years.

The study included a total of 90 girls, and the selected physiological variables were limited to vital capacity, pulse rate, and breath-holding time.

#### **Limitations**

The study acknowledged certain constraints, such as the inability to control variables like air, temperature, atmospheric pressure, and relative humidity during testing periods. The potential influence of these factors on the study results was not considered in the interpretation.

#### **Methodology**

Random sampling was employed to select 90 girls from a pool of 150 students at Govt. Girls Higher Secondary School, Ta-Deori, Gondia, Nagpur, Maharashtra, aged between 12 to 15 years. The pre- and posttests design with the analysis of covariance technique was adopted.

#### **Procedure**

**Experimentation-I:** involved 10 selected asanas training, conducted 6 days a week, with the duration gradually increasing from 20 to 40 minutes over three months.

**Experimental-II:** focused on interval training, practiced 3 days a week over three months, with the duration increasing from 20 to 40 minutes. A warm-up preceded the interval training sessions.

#### **Criterion Measures**

- Vital capacity was recorded in liters/minute.
- Pulse rate was measured in beats/min.
- Breath-holding time was recorded in seconds.

#### **Statistical Procedure**

The analysis of covariance was employed to analyze the results, and Scheff's post hoc test was used to scrutinize means and differences between groups.

#### **Conclusions**

Both yogic practices and interval training significantly improved pulse rate, breath-holding time, and vital capacity.

A significant improvement was observed in pulse rate, vital capacity, and breath-holding time when comparing the experimental Group-I (yogic practices) with the Control Group.

Similar improvements were noted in pulse rate, vital capacity, and breath-holding time when comparing the Experimental Group-II (Interval Training) with the Control Group.

Notably, when comparing the Experimental Group-I with Experimental Group-II, no significant difference in physiological variables was observed in Group-I, whereas Group-II exhibited a significant difference in physiological variables.

#### **Recommendations**

1. Similar study can be conducted using other physiological and biochemical variables.
2. The study may also be conducted in asthmatic patients.
3. Similar study can be conducted separately for boys of different age groups.
4. It is recommended that yoga shall be made a compulsory part in the physical education program in schools and colleges.

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